

## **Performance of ultra-wideband systems in the presence of WiFi and 3G signals**

### **ABSTRACT**

An analysis of the power spectral density of ultra-wideband (UWB) signals is presented in order to evaluate the effects of cumulative interference from multiple UWB devices on victim narrowband systems in their overlay bands like WiFi (i.e. IEEE802.11a) and 3rdG systems (Universal mobile telecommunications system/wideband code division multiple access). In this paper, the performances are studied through the bit-error-rate as a function of signal-to-noise ratio as well as signal-to-interference power ratio using computer simulation and exploiting the realistic channel model (i.e. modified Saleh-Valenzuela model). Several modifications of a generic Gaussian pulse waveform with lengths in the order of nanoseconds were used to generate UWB spectra. Different kinds of pulse modulation (i.e. antipodal and orthogonal) schemes were also taken into account.

**Keyword:** Ultra-wideband; Co-existence; In-band interference; UMTS/WCDMA; WiFi; Federal Communication Commission